*Slide Set for Unit/Installation Training Applications**

Cold Weather Injuries: Prevention, Identification, and Treatment

* This slide deck was prepared for adaption and local use by units/installation personnel when conducting cold injury and illness prevention training.

The information presented in these slides and notes sections (as posted) has been approved by
the Injury Prevention Program (IPP) of the Army Public Health Center (Provisional) (APHC (Prov))
as of April 2016. The IPP can be contacted at 410-436-4655 for technical consultation regarding cold illness prevention.

The requirement for Army Cold Weather Injury Prevention training is established by the Army Medical Command – the current (2013) policy memorandum is at https://www.us.army.mil/suite/doc/41860392.

This presentation material includes images from http://www.defenseimagery.mil/
as well as slides from US Army Safety Center website https://safety.army.mil/LinkClick.aspx?fileticket=o07Dn1FCWL0%3d&tabid=655 and https://safety.army.mil/LinkClick.aspx?fileticket=EzYdxFMp1cE=&tabid=655).

Additional information links and resources may be obtained from APHC (Prov) at:
http://phc.amedd.army.mil/Pages/default.aspx

Cold Weather Injuries: Prevention, Identification, and Treatment

Presenter's Name
Presenter's Command
Local Contact Information

insert date

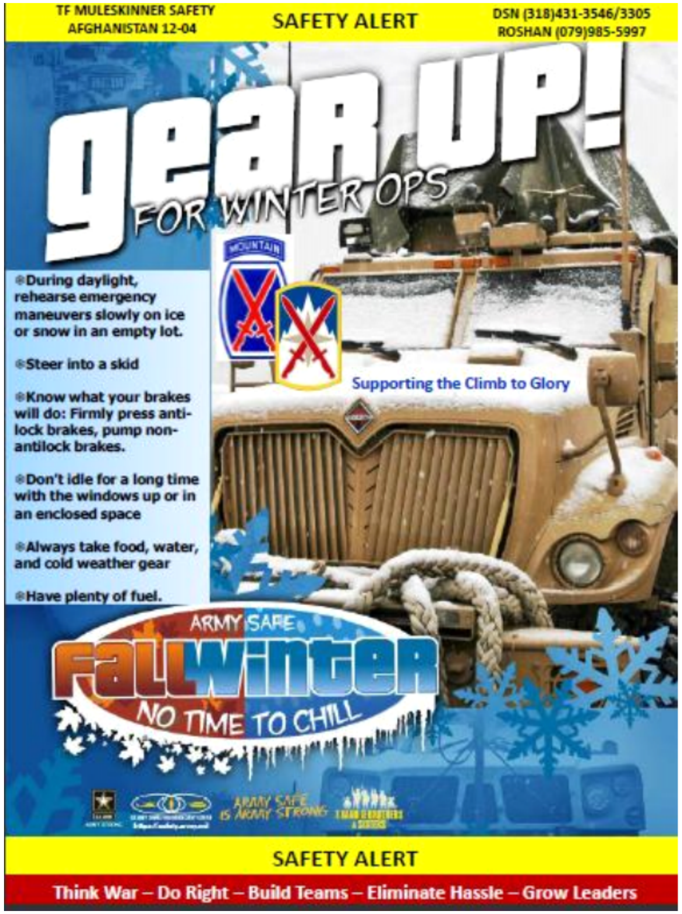
Introduction

Prevention of cold injuries is a Command and Individual Responsibility

ALL COLD WEATHER INJURIES ARE PREVENTABLE!!!

Outline

- Susceptibility Factors
- Cold Weather Injuries
  - Description
  - Identification
  - Treatment
  - Prevention
- Conclusion



Typical Victim of a Cold Weather Injury

- Male
- E-4 or below
- Around 20 years old
- From a warm climate
- Less than 18 months time in servic
- Uses tobacco, alcohol, and/or medi
- Neglects proper foot care

However, ANYONE can become a cold weather casualty!

Susceptibility Factors

- Sick or injured
- Inadequate nutrition
- Alcohol or nicotine use
- Dehydration
- Over-activity
- Under-activity
- Long exposure to the cold

- Previous cold weather injury
- Ethnic/geographic origin
- Wind, cold, rain
- Age
- Discipline and morale
- Physical stamina
- Inadequate training
- Poor clothing and equipment

Body Temperature Regulation

- Heat Production
  - Metabolism
  - Exercise
  - Shivering
- Heat Loss
  - Convection
  - Conduction
  - Radiation
  - Evaporation
  - Respiration

- When heat loss and production are in balance, body temperature is stable
- When heat loss is greater, either in an area of the body (finger, toes) or in the body core, cooling occurs
- When cooling is too great, cold weather injury can occur

Types of Cold Injuries

- Hypothermia
- Frostbite
- Non-freezing cold injuries
  - Chilblains
  - Immersion/Trench Foot

- Injuries related to cold exposure
  - Dehydration
  - Sunburn
  - Snow Blindness
  - Carbon Monoxide Poisoning

Hypothermia

- MEDICAL EMERGENCY; life threatening condition
- Severe body heat loss-body temp falls below 95°F
- Occurs when:
  - cold conditions are severe
  - conditions are windy, clothing is wet, and/or the individual is inactive
  - extended water exposure or immersion
    - 1 hour or less when water temp is below 45°F
    - prolonged exposure in slightly cool water (e.g. 60°F)
    - thunderstorms, hail, rain and accompanying winds

Hypothermia

The “umbles”-stumbles, mumbles, fumbles, and grumbles

- Initial Symptoms
  - shivering
  - dizzy, drowsy
  - withdrawn behavior
  - irritability
  - confusion
  - slowed, slurred speech
  - altered vision
  - stumbling

- Severe Stages
  - stops shivering
  - desire to lie down and sleep
  - heartbeat and breathing are faint or undetectable
  - unconsciousness followed by DEATH

Hypothermia

- Treatment
  - prevent further cold exposure
  - evacuate immediately if severe hypothermia
  - remove wet clothing
  - rewarm with body-to-body contact or in a warmed sleeping bag
  - warm, sweet liquids if conscious
  - give CPR if needed

Hypothermia

- **Prevention**
  - wear uniform properly (layers worn loosely)
  - stay dry
  - keep active
  - eat properly and often
  - warm liquids and water
  - warming tents
  - get plenty of rest
  - buddy watch/observation/NCO checks

Hypothermia Symptoms

BODY TEMP	SYMPTOMS	OBSERVABLE IN OTHERS	FELT BY YOURSELF
(Early Stage) 98.6 ⇒ 95.0	Intense and uncontrollable shivering; ability to perform complex tasks impaired	Slowing of pace. Intense shivering. Poor coordination.	Fatigue. Uncontrollable fits of shivering. Immobile, fumbling hands.
(Moderate Stage) 95.0 ⇒ 91.4	Violent shivering persists, difficulty in speaking, sluggish thinking, amnesia begins to appear.	Stumbling, lunching gait. Thickness of speech. Poor judgment.	Stumbling. Poor articulation. Feeling of deep cold or numbness.
(Severe Stages) 91.4 ⇒ 87.8	Shivering decreases; replaced by muscular rigidity and erratic, jerky movements; thinking not clear but maintains posture.	Irrationality, incoherence. Memory lapses, amnesia. Hallucinations. Loss of contact with environment.	Disorientation. Decrease in shivering. Stiffening of muscles. Exhaustion, inability to get up after a rest.
87.8 ⇒ 85.2	Victim becomes irrational, loses contact with environment, drifts into stupor; muscular rigidity continues; pulse and respiration slowed.	Blueness of skin. Decreased heart and respiratory rate. Dilation of pupils. Weak or irregular pulse. Stupor.	Blueness of skin. Slow, irregular, or weak pulse. Drowsiness.
85.2 ⇒ 78.8	Unconsciousness; does not respond to spoken words; most reflexes cease to function; heartbeat becomes erratic.	Unconsciousness.	
78.8 ▯	Failure of cardiac and respiratory control centers in brain; cardiac fibrillation; probable edema and hemorrhage in lungs; apparent death.		

Frostbite

- Air temps below 32°F
  - skin freezes at 28°F
- Superficial frostbite (mild)
  - freezing of skin surface
- Deep frostbite (severe)
  - freezing of skin and flesh, may include bone
- Hands, fingers, feet, toes, ears, chin, nose, groin area

Frostbite

- Symptoms
  - initially redness in light skin or grayish in dark skin
  - tingling, stinging sensation
  - turns numb, yellowish, waxy or gray color
  - feels cold, stiff, woody
  - blisters may develop

Frostbite

- Treatment
  - remove from cold and prevent further heat loss
  - remove constricting clothing and jewelry
  - rewarm affected area evenly with body heat until pain returns
    - when skin thaws it hurts!!
    - do not rewarm a frostbite injury if it could refreeze during evacuation or if victim must walk for medical treatment
  - do not massage affected parts or rub with snow
  - evacuate for medical treatment

Frostbite

- Prevention
  - wear uniform properly (layers and loosely)
  - keep socks and clothing dry (use poly pro/thermax liner socks and foot powder/ change insoles also)
  - warm with body heat
  - avoid skin contact with super-cooled metals or fuel
  - seek medical aid for all suspected cases
  - insulate yourself from the ground (sleeping pad/tree branches etc...)
  - "Buddy System"
  - protect yourself from wind
  - drink hot fluids and eat often
  - keep active

Chilblains

- Nonfreezing cold injury
- Cold, wet conditions (between 32-60°F, high humidity)
- Repeated, prolonged exposure of bare skin
- Can develop in only a few hours
- Ears, nose, cheeks, fingers, and toes

Chilblains

- Symptoms:
  - initially pale and colorless
  - worsens to achy, prickly sensation then numbness
  - red, swollen, hot, itchy, tender skin upon rewarming
  - blistering in severe cases

Chilblains

- Treatment
  - prevent further exposure
  - wash, dry gently
  - rewarm (apply body heat)
  - don’t massage or rub
  - dry sterile dressing
  - seek medical aid

Chilblains

- Prevention
  - keep dry and warm
  - cover exposed skin
  - wear uniform properly
  - use the “Buddy System”

Trench/Immersion Foot

- Potentially crippling, nonfreezing injury (temps from 32°F-50°F)
- Prolonged exposure of skin to moisture (12 or more hours, days)
- High risk during wet weather, in wet areas, or when sweat accumulates in boots or gloves

Trench/Immersion Foot

- Symptoms
  - initially appears wet, soggy, white, shriveled
  - sensations of pins and needles, tingling, numbness, and then pain
  - skin discoloration-red, bluish, or black
  - becomes cold, swollen, and waxy in appearance
  - may develop blisters, open weeping, or bleeding
  - in extreme cases, flesh dies

Trench/Immersion Foot

- Treatment
  - prevent further exposure
  - dry carefully
  - DO NOT break blisters, apply lotions, massage, expose to heat, or allow to walk on injury
  - rewarm with body heat
  - clean and wrap loosely
  - elevate feet to reduce swelling
  - evacuate for medical treatment

Trench/Immersion Foot

- Prevention
  - keep feet dry
  - change socks and apply foot powder at least every 8 hours or whenever wet
  - bring extra boots to field
  - no blousing bands
  - report all suspected cases to leaders

Dehydration

- A condition caused by the excessive loss of water from the body
- May increase the risk of hypothermia due to impaired ability to keep active and generate body heat

Dehydration

- Symptoms
  - irritability
  - dark urine
  - headache
  - decreased amount of urine being produced
  - dizziness, nausea
  - mental sluggishness
  - weakness
  - increased or rapid heartbeat
  - dry mouth, tongue, throat, lips
  - lethargic
  - lack of appetite
  - stomach cramps or vomiting

Dehydration

- Treatment
  - drink WATER or other warm liquids
  - do not eat snow
  - rest

Dehydration

- Prevention
  - drink minimum of 3 canteens of water daily if inactive and 5-6 quarts if active
  - monitor urine color
  - do not wait until you are thirsty
  - drink hot liquids for warmth

Sunburn

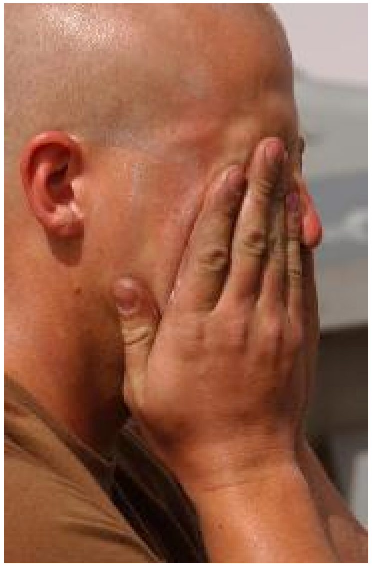
- Burning of the skin due to overexposure to the sun and UV light
- Contributing factors
  - prolonged exposure
  - fair skin, light hair
  - exposed skin
  - reflective qualities of the snow
  - high altitudes

- Symptoms
  - redness of skin, slight swelling (1st deg)
  - (2nd deg)
    - pain and blistering
    - chills, fever, headache

Sunburn

- Prevention
  - covering exposed skin with clothing
  - sunscreen, lip balm
  - limit exposure of skin to the environment

- Treatment
  - soothing skin cream in mild cases
  - in severe cases, seek medical attention
  - aspirin for pain



Carbon Monoxide Poisoning

- When oxygen in the body is replaced by carbon monoxide
  - colorless, odorless, tasteless gas resulting from incomplete combustion
- Inadequate stoves, heaters

Carbon Monoxide Poisoning

- Symptoms
  - headache
  - dizziness
  - weakness
  - excessive yawning
  - ringing in ears
  - confusion
  - nausea
  - bright red lips, eyelids
  - drowsiness
  - unconsciousness
  - possibly death

Carbon Monoxide Poisoning

- Treatment
  - move to fresh air immediately
  - seek medical aid promptly
  - provide mouth-to-mouth resuscitation if victim is not breathing

Carbon Monoxide Poisoning

- Prevention
  - ensure proper ventilation
  - don’t use unvented heaters or engines
  - ensure heaters are regularly serviced
  - turn heaters off when not needed (during sleep)
  - never sleep in vehicle with engine running
  - never wrap poncho around vehicle exhaust to collect heat

Snow Blindness

- Inflammation and sensitivity of the eyes caused by ultraviolet rays of the sun reflected by the snow or ice

- Symptoms
  - gritty feeling in eyes
  - redness and tearing
  - eye movement will cause pain
  - headach

Snow Blindness

- Prevention
  - eye protection
    - dark, UV protective glasses
    - field expedient-cut narrow slits in MRE cardboard and tie around head
  - do not wait for discomfort to begin

- Treatment
  - remove from sunlight
  - blindfold both eyes or cover with cool, wet bandages
  - seek medical attention
  - recovery may take 2-3 days

Conclusion

- Dress properly
- Drink plenty of fluids
- Eat right
- Keep in shape
- Get plenty of rest
- Minimize periods of inactivity
- Maintain a positive attitude

References and Resources

- TB MED 508 *Prevention and Management of Cold Weather Injuries*
- TC 21-3 *Soldier's Handbook for Individual Operations and Survival in Cold-Weather Areas*
- FM 21-10 *Field Hygiene and Sanitation*
- FM 4-25.11 *First Aid*
- US Army Public Health Command Cold Weather Injury Prevention webpage – http://phc.amedd.army.mil/topics/discond/cip/Pages/ColdCasualtiesInjuries.aspx
- US Army Research Institute of Environmental Medicine Guidance Downloads webpage - http://www.usariem.army.mil/index.cfm/publications/guidance

QUESTIONS?